```
**************************************************************
*                                                            *
*          QQQQQQQ     ZZZZZZZZZ   XX      XX               *
*        QQQQQQQQQQ    ZZZZZZZZ     XX    XX                *
*        QQ      QQ          ZZ      XX XX                  *
*        QQ      QQ        ZZ          XXX                  *
*        QQ      QQ       ZZ           XXX                  *
*        QQ    QQ QQ     ZZ            XX XX                *
*        QQQQQQQQQQ     ZZZZZZZZ      XX   XX               *
*          QQQQQQQQ     ZZZZZZZZZ    XX     XX              *
*                QQ                                          *
*                                                            *
**************************************************************
```


The Journal Covering Amateur Radio & Sinclair Computers
ZX-80, Micro Ace, ZX-81, & Timex Sinclair 1000
2025 O'Donnell Drive
Las Cruces, New Mexico
88001

Alex F. Burr,K5XY
Publisher

Ambrose 'Bo' Barry,W4GHV/5
Editor

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FLASH!
NU4V RTTY system available
(see next issue)

(Reprinted with permission)

QZX

A newsletter? How do you review a newsletter for *73*? It doesn't beep, light up, plug in, or charge your batteries.

But *QZX*, the newsletter for hams who own Sinclair/Timex computers, does transmit. It transmits a lot of very good information, and we thought the best way to bring it to our readers' attention would be through a close look at what it does provide.

First, let's start out with the products it serves—the ZX-80, Micro Ace, ZX-81, and TS-1000. With an average $50 price tag, these are among the best computer buys a ham can make. A low-end computer is one of the best ways to get on RTTY or packet radio, costing less than many a model 33 in the flea market. A small extra investment in time to write software and build an interface with your rig is all you need—and that's time you would spend cleaning grease off the gears of an old Teletype® machine.

Ham applications for computers differ from many others in that they do not require large amounts of memory, rapid storage-medium access, or complex mathematical calculations. What they do require is easy access to I/O ports and simplicity of real-time programming. The Sinclair, with its TTL interfacing, meets the first requirement, and the plethora of Z-80 assembly-language manuals makes learning the Timex/Sinclair computers' native language that much easier.

In addition to communications uses, you can develop the extras—like an electronic logbook, dupe sheets, or even a rotor controller. These models, with very accessible innards, seem to be designed with the hardware hacker in mind.

The Need For Support

Unless you are a super-fast designer with an endless stream of creative ideas and lots of time on your hands, you need assistance in developing uses for your computer. Computer dealers are notorious for knowing little about ham/computer interfacing, and the staff in the department stores which offer you the best prices on Sinclair/Timex computers know even less about computers in general, much less amateur radio.

This is where *QZX* comes in. As a system-specific publication, everything in the magazine pertains to your computer. As an amateur-radio publication, it offers the additional advantage of focusing on a specific area of computer use.

Published by Alex F. Burr K5XY and edited by Ambrose Barry W4GHV/5, each month's *QZX* is literally jammed with programs and circuits. For example, the April issue contained programs to compute antenna headings, manage net rosters, and calculate propagation, as well as a RTTY send/receive program. Circuits included a simple terminal unit and an interface for the Sinclair computers.

In addition to the program, a brief synopsis of each is provided. Explanations of algorithms and special instructions are included as well. And the listings are reproduced directly from the author's printout, eliminating the possibility of typing errors.

Another regular feature of *QZX* covers reviews. The publishers are up front about their policy; in one recent issue, they said "if you have objections to us doing reviews of products advertised in *QZX*, let us know. We intend to present objective comments on them. If an item advertised in *QZX* is obtained for review and found to be less than 'OK' in our opinion, we will simply decline to print that review. A rather polite way of avoiding a 'cut throat.' Those not advertised but reviewed will receive our honest opinions and will be printed."

A useful column in the newsletter is "Bits & Bytes," a compendium of useful tips similar to *73*'s "Circuits" feature. Subjects ranging from power-supply problems to photographing program listings from your video monitor are all addressed here. And if you miss a juicy topic, information on it may be recovered via the *QZX* Net, an almost nightly gathering of the Timex/Sinclair faithful, the schedule for which appears in the newsletter.

The newsletter is printed on plain paper and graphics are limited to schematics. All of this adds up to savings in production costs—savings which are passed on to subscribers. At $12 for a one-year subscription, *QZX* is much cheaper than a slick magazine, and in terms of applicable material, you probably get a lot more for your money.

From programs to reviews and advertising, *QZX* is a perfect solution to one of the great problems of owning a computer—what to do with it. As amateurs, we have the unique ability to generate new ideas and practical uses for almost any piece of electronic equipment. But newsletters such as *QZX* are necessary for us to share all of that knowledge.

For more information, contact QZX *Newsletter, 2025 O'Donnell, Las Cruces NM 88001*. Reader Service number 484.

Avery L. Jenkins WB8JLG
***73* Staff**

BEST KEYBOARD AVAILABLE!

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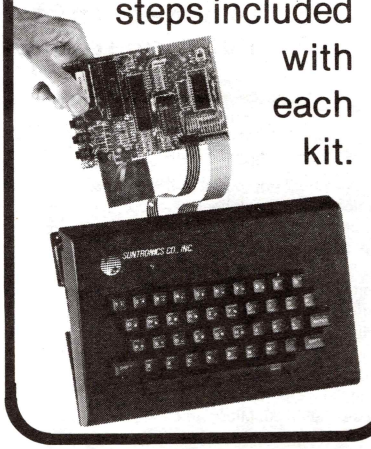

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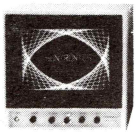
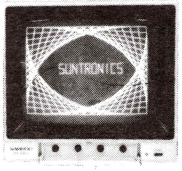
SAMWOO provides a much better picture for your Sinclair Computer than your TV monitor. Simple modification procedure includes easy-to-follow instructions.





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"QSL" PROGRAM

BY BOB LEES, W3ZQN

AUGUST, 1983

IF YOU HAVE A PRINTER FOR YOUR TIMEX/SINCLAIR COMPUTER, YOU MIGHT LIKE TO TRY THIS 16K BASIC PROGRAM TO PRINT QSLS. IT HAS LOTS OF BELLS AND WHISTLES THAT ALLOW YOU TO AVOID HAVING TO REINPUT REPETATIVE DATA AND INCLUDES MORE INFORMATION THAN IS USUALLY FOUND ON A ONE SIDED, POST CARD SIZE QSL.

*** "QSL" PROGRAM FEATURES ***

THE SAMPLE SHOWS OUTPUT FROM THE PROGRAM FOR FICTITIOUS STATION PY0ZZZ/PY1 OPERATED BY SYLVESTER. THE FOLLOWING FEATURES ARE INCLUDED:

- INFORMATION IS COMPLETE, INCLUDING QTH, ZONES, COUNTY, RIG AND ANTENNA.
- UP TO FOUR LINES OF STANDARD COMMENTS MAY BE SELECTED WITHOUT ENTERING THEM MANUALLY. IF TWO OR LESS LINES ARE SELECTED, THE COMMENTS AUTOMATICALLY ARE CENTERED IN THE AVAILABLE SPACE FOR A MORE PLEASING APPEARANCE.
- ALL INPUTS ARE PROMPTED AND RECORDED ON THE SCREEN PRIOR TO THE QSL BEING PRINTED.
- ANTENNA INFORMATION IS AUTOMATICALLY SELECTED BY THE PROGRAM BASED ON THE BAND INPUT.
- THERE IS PROVISION TO ENTER THE OTHER STATIONS CONTACT NUMBER FOR CONTEST CONTACTS.
- QSL APPEARANCE WILL BE ACCEPTABLE WHETHER OR NOT YOU ENTER THE OTHER OPERATOR'S NAME.
- THE QSL IS POST CARD SIZE.
- INFORMATION THAT DOES NOT CHANGE FROM THE PREVIOUSLY PRINTED QSL, SUCH AS THE DATE, BAND AND MODE, DOES NOT HAVE TO BE REENTERED.
- QSL FORMAT IS AUTOMATICALLY ADJUSTED FOR "PSE QSL" OR "QSL TNX" BY ONE KEYSTROKE.
- ANY OF THE STANDARD COMMENTS, RIG OR ANTENNA INFORMATION CAN BE ALTERED AS REQUIRED FOR A PARTICULAR QSL.

OF COURSE THERE ARE SOME DISADVANTAGES TO THIS METHOD OF GENERATING QSLS:

* TIMEX/SINCLAIR PRINTER PAPER IS NOT EXACTLY POST CARD STOCK! TO SEND AN INDIVIDUAL QSL YOU MUST PASTE THE PRINTOUT TO A POST CARD OR SEND IT IN AN ENVELOPE. OR, FOR DX QSLS, YOU CAN USE AN OUTGOING QSL SERVICE SUCH AS THE ARRL'S. SINCE THE ARRL CHARGES ONE DOLLAR PER POUND (FOR MEMBERS ONLY) YOU CAN SEND A LOT MORE OF THESE FOR A DOLLAR THAN YOU COULD REGULAR CARDS.
* THE QSL FORMAT IS VERTICAL RATHER THAN HORIZONTAL. SOME MAY FIND THIS UNDESIREABLE.
* QSL'S ARE PRINTED IN A STRIP AND MUST BE CUT APART AND THEIR VERTICAL EDGES TRIMMED TO ACHIEVE POST CARD SIZE.

*** STRING VARIABLES ***

THE STRING VARIABLES USED IN THE PROGRAM ARE AS FOLLOWS:

I$ - GENERAL INPUT VARIABLE FOR EVERYTHING EXCEPT GENERAL COMMENTS.

L$(28) - THE ANTENNA SELECTED FOR PRINTING. MAY BE ANY OF THE ELEMENTS OF A$ OR A SPECIAL INPUT.

J$(4,32) - THE FOUR GENERAL COMMENTS SELECTED FOR PRINTING. J$(1) MAY BE ANY OF THE G$ ELEMENTS OR A SPECIAL INPUT. OTHER J$ ELEMENTS MAY BE ANY OF THE H$ ELEMENTS OR SPECIAL INPUTS.

M$(3) MODE, INITIALIZED TO "CW " (LINE 130).

C$(10) - CALL OF THE STATION WORKED.

D$(2) - DAY OF THE MONTH.

F$(3) - MONTH IN 3 LETTER FORMAT SUCH AS JAN, FEB, MAR, ETC.

Y$(2) - LAST TWO DIGITS OF THE YEAR. INITIALIZED TO "83" (LINE 138).

T$(4) - TIME IN FOUR DIGIT UTC.

B$(3) - BAND IN MHZ. INITIALIZED TO "14" (LINE 142).

R$(3) - RST. INITIALIZED TO "579" (LINE 144).

E$(28) - RIG DESCRIPTION.

A$(3,28) - THREE STANDARD ANTENNAS SELECTED BY THE PROGRAM BASED ON THE CONTENTS OF B$.

N$(9) - OTHER STATION OPERATOR'S NAME. USE IS OPTIONAL.

G$(10,32) - TEN STANDARD FIRST GENERAL COMMENTS.

H$(10,32) - TEN STANDARD SECOND, THIRD OR FOURTH GENERAL COMMENTS.

S$(4) - QSO NUMBER OF THE OTHER STATION FOR CONTEST CONTACTS, USED IN COMMENT G$(5), LINE 180. USE IS OPTIONAL.

U$ - GENERAL INPUT VARIABLE FOR NONSTANDARD GENERAL COMMENTS.

*** PROGRAM NOTES ***

I FOUND THAT TWO FULL SCREENS OF INFORMATION (22 X 2 OR 44 LINES) IS JUST ABOUT EQUIVALENT TO THE LENGTH OF A STANDARD POST CARD. THE FIRST SCREEN CONTAINS ONLY PERMANENT INFORMATION AND GRAPHICS AND IS PRINTED BY LINES 5285 THROUGH 5410 INCLUSIVE.

THE SECOND SCREEN CONTAINS PERMANENT PLUS VARIABLE INFORMATION AND IS PRINTED BY LINES 5420 THROUGH 5065 INCLUSIVE.

OVERALL PROGRAM ARRANGEMENT IS AS FOLLOWS (NUMBERS REFER TO PROGRAM LINES):

6-90 - INITIAL TITLE SCREEN PLUS OPTION TO CONTINUE OR EXIT.

95-200 - SETS STRING ARRAY DIMENSIONS AND ESTABLISHES THE INITIAL CONTENTS OF CERTAIN VARIABLES. FOR EXAMPLE, MY MOST COMMON CONTACT IS ON CW, 14 MHZ, DURING 1983 WITH A GIVEN RST OF 579. THEREFORE I INITIALIZE THESE VALUES INTO THE VARIABLES WITH THE HOPE THAT I WILL NOT HAVE TO CHANGE THEM FOR THE FIRST QSL.

205-289 - INPUT OF DATA: MODE, CALL, DAY, MONTH, YEAR, TIME, BAND, RST, NAME, RIG, ANTENNA, QSO NUMBER AND PSE OR TNX QSL. INFORMATION UNCHANGED FROM THE INITIALIZATION ROUTINE ABOVE OR FROM THE PREVIOUS QSL PRINTED NEED NOT BE REKEYED. YOU JUST HIT "ENTER" AND MOVE TO THE NEXT DATA ENTRY.

872-1250 - INPUT GENERAL COMMENTS 1 THROUGH 4. COMMENT 1 IS SELECTED FROM THE CONTENTS OF STRING ARRAY G$, LINES 872 TO 890. COMMENTS 2, 3 AND 4 ARE SELECTED FROM STRING ARRAY H$, LINES 892 TO 910. THESE GENERAL COMMENTS ARE DISPLAYED ON THE SCREEN AND ARE SELECTED BY ENTERING A NUMBER 1 THROUGH 10. TO TYPE IN A SPECIAL, NONSTANDARD COMMENT ENTER THE NUMBER "11". TO SKIP FURTHER GENERAL COMMENTS ENTER THE NUMBER "0".

5285-6095 - PRODUCE AND PRINT THE QSL.

6096-6130 - RESETS COMMENTS AND SELECTS RECYCLE FOR NEXT QSL OR EXIT.

7000-7010 - ALTERNATIVE COMMENT USED WHEN A QSL HAS BEEN RECEIVED.

9000-9010 - PROGRAM AUTO START.

*** REQUIRED CHANGES ***

YOU WILL HAVE TO MAKE THE FOLLOWING CHANGES IN ORDER TO CUSTOMIZE THIS PROGRAM FOR YOUR STATION (NUMBERS REFER TO PROGRAM LINES):

130 - CHANGE "CW " TO YOUR MOST COMMON MODE OF OPERATION (SSB, CW, FM, ETC.). 3 CHARACTERS MAX.

142 - CHANGE "14" TO YOUR MOST COMMON BAND (3.5, 7.0, 21, ETC.). 3 CHARACTERS MAX.

144 - CHANGE "579" TO THE RST YOU GIVE MOST.

146 - CHANGE TO DESCRIBE YOUR RIG. 28 CHARACTERS MAX.

148 - CHANGE TO DESCRIBE YOUR ANTENNA FOR 20, 15 AND 10 METERS. 28 CHARACTERS MAX.

150 - SAME BUT FOR 40 METERS.

152 - SAME BUT FOR 80 METERS.

777-797 - YOU MAY HAVE TO REARRANGE THE ANTENNA SELECTION ROUTINE IN ORDER FOR IT TO WORK WITH YOUR PARTICULAR COMBINATION OF ANTENNAS ON THE VARIOUS BANDS.

906, 908 AND 910 - INSERT COMMENTS APPROPRIATE TO YOU.

5290-5400 - YOU ARE ON YOUR OWN. YOU CAN PRACTICE YOUR COMPUTER GRAPHICS SKILLS AS YOU INSERT YOUR OWN NAME, ADDRESS, CALL, ETC.

5420-5460 - SAME AS ABOVE, MORE CHANCES TO BECOME CREATIVE.

6053 - INSERT YOUR NAME.

6060 - DESCRIBE YOUR COMPUTER.

*** FINAL THOUGHTS ***

I WOULD BE GLAD TO HEAR FROM THOSE WHO TRY THIS PROGRAM, ESPECIALLY IF THEY MAKE IMPROVEMENTS. AS WITH MY OTHER PROGRAMS PUBLISHED IN "QZX", I WILL SUPPLY A CASSETTE CONTAINING TWO COPIES OF THIS PROGRAM PLUS A FULL SIZE COPY OF THIS ARTICLE TO ANY WHO SEND $10.00 VIA CHECK OR MONEY ORDER TO ME AT: 705 JONATHAN DR., KING OF PRUSSIA, PA. 19406. OF COURSE, YOU WILL STILL HAVE TO MAKE ALL THE REQUIRED CHANGES TO PERSONALIZE "QSL". GOOD LUCK AND HAVE FUN WITH

" Q S L "

```
360 LET D$=I$
370 PRINT AT 2,12;D$
380 PRINT AT 3,0;"MONTH   (3)"
390 PRINT AT 21,1;F$
400 INPUT I$
410 IF I$="" THEN GOTO 430
420 LET F$=I$
430 PRINT AT 3,12;F$
440 PRINT AT 4,0;"YEAR    (2)"
450 PRINT AT 21,1;Y$;" "
460 INPUT I$
470 IF I$="" THEN GOTO 490
480 LET Y$=I$
490 PRINT AT 4,12;Y$
500 PRINT AT 5,0;"TIME    (4)"
510 PRINT AT 21,1;"XXXX"
520 INPUT T$
550 PRINT AT 5,12;T$
560 PRINT AT 6,0;"BAND    (3)"
570 PRINT AT 21,1;B$;" "
580 INPUT I$
590 IF I$="" THEN GOTO 610
600 LET B$=I$
610 PRINT AT 6,12;B$
620 PRINT AT 7,0;"RST     (3)"
630 PRINT AT 21,1;R$
640 INPUT I$
650 IF I$="" THEN GOTO 670
660 LET R$=I$
670 PRINT AT 7,12;R$
680 PRINT AT 8,0;"NAME    (9)"
690 PRINT AT 21,1;"XXXXXXXXX"
700 INPUT N$
730 PRINT AT 8,12;N$
735 PRINT AT 9,0;"RIG     (28)"
740 PRINT AT 21,1;E$
745 INPUT I$
750 IF I$="" THEN GOTO 760
755 LET E$=I$
760 PRINT AT 9,12;E$( TO 20)
765 PRINT AT 10,12;E$(21 TO )
770 PRINT AT 11,0;"ANT    (28)"
775 LET L$(1)=" "
777 IF B$="14 " THEN LET L$=A$(
1)
779 IF B$=" 14" THEN LET L$=A$(
1)
781 IF B$="21 " THEN LET L$=A$(
1)
783 IF B$=" 21" THEN LET L$=A$(
1)
785 IF B$="28 " THEN LET L$=A$(
1)
787 IF B$=" 28" THEN LET L$=A$(
1)
789 IF B$(1)="7" THEN LET L$=A$
(2)
791 IF B$=" 7 " THEN LET L$=A$(
2)
793 IF B$="  7" THEN LET L$=A$(
2)
795 IF B$(1)="3" THEN LET L$=A$
(3)
797 PRINT AT 21,1;L$
798 IF L$(1)="" THEN PRINT AT
21,1;"INPUT ANT, 28 CHARACTERS M
AX."
799 INPUT I$
800 IF I$="" THEN GOTO 805
802 LET L$=I$
805 PRINT AT 11,12;L$( TO 20)
807 PRINT AT 12,12;L$(21 TO )
809 PRINT AT 13,0;"QSO NR (4)"
811 PRINT AT 21,1;"XXXX"
813 INPUT S$
819 PRINT AT 13,12;S$
821 PRINT AT 18,1;"FOR ""PSE QS
L"" HIT ""ENTER""." " FOR ""QSL R
ECEIVED"" ENTER ""R""," TO EXIT
ENTER ""E""," TO RECYCLE ENTER
ANYTHING ELSE"
823 INPUT I$
825 IF I$="" OR I$="R" THEN GOT
O 829
826 IF I$="E" THEN STOP
827 GOTO 200
829 CLS
872 LET G$(1)="THIS WAS A GOOD
SOLID DX CONTACT"
874 LET G$(2)="SOLID, ARMCHAIR
COPY ALL THE WAY"
876 LET G$(3)="CONDX WERE POOR
BUT COPY WAS OK"
878 LET G$(4)="CONDITIONS AND
COPY WERE POOR"
880 LET G$(5)="THIS WAS UR CONT
EST QSO NR "+S$
882 LET G$(6)="I HAVE NO QSL FR
OM YOUR COUNTRY"
884 LET G$(7)="THIS QSO IS A NE
W COUNTRY FOR ME"
886 LET G$(8)="HV NO QSL FM UR
STATE ON "+B$+" MHZ"
888 LET G$(9)="ENJOYED THIS PR
OLONGED RAGCHEW"
890 LET G$(10)="GLAD TO MEET Y
OU IN THE CONTEST"
892 LET H$(1)="I WOULD LIKE UR
QSL FOR MY FILE"
894 LET H$(2)="I HOPE WE CAN CO
NTACT AGAIN SOON"
896 LET H$(3)="LETS QSO AGN WHE
N CONDX IMPROVE"
898 LET H$(4)="YOUR QSL NEEDED
FOR 1 BAND ""WAS"""
900 LET H$(5)="I WOULD LIKE YOU
R QSL FOR ""DXCC"""
902 LET H$(6)="GLAD TO HAVE MET
U VIA HAM RADIO"
904 LET H$(7)="GLAD TO SEND THE
QSL U REQUESTED"
906 LET H$(8)="BEEN A HAM 29 YR
S--STILL LOVE IT"
908 LET H$(9)="BEEN A HAM FOR 2
9 OF MY 44 YEARS"
910 LET H$(10)="IM ON HF CW BAN
DS AND 2 METER FM"
933 FOR C=1 TO 10
935 PRINT " ";C
940 PRINT G$(C)
950 NEXT C
955 PRINT AT 20,0;"ENTER 1 -
ENTER ""11"" FOR OTHERENTER ""0""
 FOR NONE"
960 INPUT G
970 IF G=11 THEN GOTO 1000
975 IF G=0 THEN GOTO 1250
980 LET J$(1)=G$(G)
990 GOTO 1050
1000 CLS
1010 PRINT AT 21,0;"ENTER COMMEN
T 1 - 32 CHAR. MAX."
1020 INPUT U$
1030 LET J$(1)=U$
1050 CLS
1070 FOR C=1 TO 10
1080 PRINT " ";C
1090 PRINT H$(C)
1100 NEXT C
1105 FOR A=2 TO 4
1110 PRINT AT 20,0;"ENTER COMMENT ";A;
" - ENTER ""11"" FOR OTHERENTER
""0"" FOR NONE"
1115 INPUT H
1120 IF H=11 THEN GOTO 1145
1125 IF H=0 THEN GOTO 1250
1130 LET J$(A)=H$(H)
1140 GOTO 1180
1145 PRINT AT 20,0;"
1150 PRINT AT 21,0;"ENTER COMMEN
T ";A;" - 32 CHAR. MAX."
1160 INPUT U$
```

SAMPLE QSL

SELECTABLE, STANDARDIZED GENERAL COMMENTS 1-4

```
     ROBERT J. LEES, "BOB"
       705 JONATHAN ROAD
KING OF PRUSSIA, PA. 19406 USA
--------------------------------
MONTGOMERY CO.-ARRL SEC E. PA.
ITU ZONE 8   -   CQ/WAZ ZONE 5

W3ZQN

CONFIRMING 2-WAY CW QSO WITH
RADIO PY0ZZZ/PY1 ON 21 AUG, 1983
AT 2345 UTC ON 14 MHZ / RST 579
--------------------------------
RIG TEN-TEC CENTURY/21-60 WTS IN
ANT 2 EL HQ-1 MINI-QUAD 10 M HI
--------------------------------
TNX FOR THE CONTACT SYLVESTER
THIS WAS A GOOD SOLID DX CONTACT
I WOULD LIKE UR QSL FOR MY FILE
GLAD TO HAVE MET U VIA HAM RADIO
BEEN A HAM 29 YRS--STILL LOVE IT
PLEASE QSL SYLVESTER#### 73, BOB
--------------------------------
(QSL BY SINCLAIR ZX-81 COMPUTER)
```

FIRST SCREEN

SECOND SCREEN

```
  8 FAST
  9 PRINT "          PROGRAM ""Q
SL"""
 10 PRINT "      BY R. J. LEES,
 W3ZQN"
 11 PRINT "         705 JONATHAN
 RD.,"
 12 PRINT " KING OF PRUSSIA, PA
, 19406 USA"
 13 PRINT "              JULY, 198
3"
 14 PRINT ""
 15 PRINT "THIS PROGRAM, WHEN U
SED WITH THE"
 16 PRINT "TIMEX/SINCLAIR  204
0  PRINTER,"
 17 PRINT "PRINTS POSTCARD SIZE
 QSLS.  DATA"
 18 PRINT "THAT MAY BE THE SAME
 FROM QSL TO"
 19 PRINT "QSL IS RETAINED TO E
LIMINATE THE"
 20 PRINT "NEED TO REENTER IT.
 DO NOT EX-"
 21 PRINT "CEED  THE  NUMBER OF
 CHARACTERS"
 22 PRINT "SHOWN IN (). TURN ON
 THE PRINTER"
 23 PRINT "BEFORE STARTING THE
PROGRAM. HIT"
 24 PRINT ""ENTER"" TO START.
 ENTER ""E"" TO"
 25 PRINT "EXIT."
 85 INPUT I$
 90 IF I$="E" THEN STOP
 96 DIM L$(28)
 98 DIM J$(4,32)
100 DIM M$(3)
102 DIM C$(10)
104 DIM D$(2)
106 DIM F$(3)
108 DIM Y$(2)
110 DIM T$(4)
112 DIM B$(3)
114 DIM R$(3)
116 DIM E$(28)
118 DIM A$(3,28)
120 DIM N$(9)
122 DIM G$(10,32)
124 DIM H$(10,32)
126 DIM S$(4)
130 LET M$="CW "
134 LET D$="XX"
136 LET F$="XXX"
138 LET Y$="83"
142 LET B$="14 "
144 LET R$="579"
146 LET E$="TEN-TEC CENTURY/21-
60 WTS IN"
148 LET A$(1)="2 EL HQ-1 MINI-Q
UAD  10 M HI"
150 LET A$(2)="COAX FED DIPOLE
 -  15 FT HI"
152 LET A$(3)="100 FT END FED W
IRE 20 FT HI"
200 CLS
205 PRINT AT 0,0;"MODE    (3)"
210 PRINT AT 21,1;M$
220 INPUT I$
230 IF I$="" THEN GOTO 250
240 LET M$=I$
250 PRINT AT 0,12;M$
260 PRINT AT 1,0;"CALL    (10)
270 PRINT AT 21,1;"XXXXXXXXXX"
280 INPUT C$
310 PRINT AT 1,12;C$
320 PRINT AT 2,0;"DAY     (2)"
330 PRINT AT 21,1;D$;"
 "
340 INPUT I$
350 IF I$="" THEN GOTO 370
```

```
1170 LET J$(A)=U$
1180 NEXT A
1250 CLS
5285 PRINT "
5290 PRINT "  ROBERT J. LEES,
 ""BOB""
5300 PRINT "  705 JONATHAN
ROAD
5310 PRINT "  KING OF PRUSSIA, PA
. 19406 USA"
5315 PRINT "  ----------
----------
5320 PRINT "  MONTGOMERY CO.-ARRL
 SEC E, PA,
5325 PRINT "  ITU ZONE 8  -  CQ
/WAZ ZONE 5"
5330 PRINT "
5340 PRINT
5345 PRINT "
5350 PRINT "
5355 PRINT "
5360 PRINT "
5365 PRINT "
5370 PRINT "
5375 PRINT "
5380 PRINT "
5385 PRINT "
5386 PRINT
5390 PRINT "
5395 PRINT "
5400 PRINT "
5405 COPY
5410 CLS
5420 PRINT "
5426 PRINT "
5430 PRINT "
5440 PRINT "
5460 PRINT "
5930 PRINT "CONFIRMING  2-WAY  "
)M$;" QSO  WITH"
5940 PRINT "RADIO ";C$;" ON ";D$
;" ";F$;"  19";Y$
5950 PRINT "AT ";T$;" UTC ON ";B
$;" MHZ / RST ";R$
5970 PRINT "----------
----------"
6000 PRINT "RIG ";E$
6010 PRINT "ANT ";L$
6015 PRINT "----------
----------"
6020 IF I$="R" THEN GOTO 7000
6030 PRINT "TNX  FOR  THE CONTAC
T  ";N$
6035 IF J$(3,1)=" " THEN PRINT
6040 PRINT J$(1)
6045 PRINT J$(2)
6046 IF J$(3,1)=" " THEN PRINT
6047 IF J$(3,1)=" " THEN GOTO 60
52
6050 PRINT J$(3)
6051 PRINT J$(4)
6052 IF I$="R" THEN PRINT TAB 25
;"73, BOB"

6053 IF I$="" THEN PRINT "PLEASE
 QSL ";N$;" #### 73, BOB"
6056 PRINT "----------
----------"
6060 PRINT "(QSL BY SINCLAIR ZX-
81 COMPUTER)"
6061 PRINT
6063 PRINT "
6065 COPY
6095 CLS
6096 FOR A=1 TO 4
6097 LET J$(A)=""
6098 NEXT A
6100 PRINT AT 20,0;"TO CONTINUE
HIT ""ENTER"";"TO EXIT ENTER ""
F""
6110 INPUT I$
6120 IF I$="E" THEN STOP
6130 GOTO 200
7000 PRINT "  TNX  FOR  QSO  AND  Q
SL  ";N$
7010 GOTO 6040
9000 SAVE "QSL"
9010 GOTO 8
```

NOTE: YOU PROGRAM REGULAR "L". COMPUTER WILL CHANGE IT TO INVERSE "L".

UPDATE ON "TYPE" PROGRAM FROM MAY, 1983 "QZX".

THERE SEEMS TO BE A LOT OF INTEREST IN "TYPE". I'VE HEARD FROM SEVERAL WITH SUGGESTED CHANGES. ONE REALLY GOOD MODIFICATION SENT BY HARRY, K1UFS, ALLOWS EDITING BY LINE AND COLUMN NUMBER. (THE ORIGINAL VERSION EDITED BY LINE NUMBER ONLY AND OFTEN REQUIRED REENTERING A WHOLE LINE.) HERE ARE THE CHANGES: ADD NEW LINES 625 AND 925 TO READ "INPUT C". REVISE LINES 630 AND 930 TO READ "GOTO 30".

THE ZX COMPILER

generates a machine code program from one written in an integer subset of Timex/Sinclar Basic

machine code may reside anywhere in memory

commands/functions		
DIM	RAND	·256 variables (two letter)
FOR/NEXT	CLS -	·26 single DIM arrays
LET	COPY	
IF/THEN	SCROLL	·16 bit arithemetic
GOTO	AND, OR	
GOSUB/RETURN	NOT	·PRINT & INPUT in
PRINT	ABS	hex or decimal
LPRINT	SGN	·modulus function
PLOT/UNPLOT	USR	
POKE	RND	·hi and lo memory
STOP	PEEK	versions
FAST	INKEY$	(28·32k & 12·16k)
SLOW	MOD\	
PAUSE	AT & TAB	

both versions on one cassette **$ 25.00**

THE ZX ASSEMBLER & DISASSEMBLER

newly revised, one 4k program does all this:
- assembles standard mnemonics to machine code, source code in REM statements
- generates hex or decimal disassemblies to screen or printer
- allows hex or decimal editing of memory
- binary SAVE and LOAD files
- generates a REM statement of any size
- supplied in two versions, as compiler

both versions on one cassette **$ 20.00**

NEW!

SOFTWARE ON EPROM

one 2764, half blown, for cartridge below

ZX COMPILER	$30.00
ZX ASSEMBLER/DISASSEMBLER	$25.00

for one 2732A or two 2716-1's, add $5.00

EPROM CARTRIDGE KIT

plug-in, uncased board holds one 2716, 2732, or 2764 mapped 0-16k, jumper selectable, kit includes board, decoder chip, 28 pin socket, ZX connector, tailpiece, small parts, and instructions

Kit $18.00

THE ZX SERIAL PRINTER INTERFACE

plans and listing

RS-232 ASC II output thru MIC port. hardware cost about $10—280 bytes of machine code prints, characters, strings & listings. One connection within case.

$ 5.00

CINAGRO SOFTWARE
(formerly Bob Berch)
155 Seventh St.
Rochester, N.Y. 14609

all prices include shipping • NYS residents add 7% tax

Deluxe QSL Printing Program

Bob Lees, W3ZQN

I know we have printed other QSL printing programs, but this one from Bob looked a little fancier than most, so here it is. He sent it 'camera ready' using his TYPE program and said he was out of ideas for articles! So, send him some inspirations, he writes nice articles!

RS-232 to Video - the Easy Way

Bo Barry, W4GHV/5

With the trusty ZX81/TS1000 destined for a place in a dusty closet, here's a way to put it to use in the event you need a video output from a device having a RS232 serial port. Two examples are the HP41C calculator/computer and Tandy's new Model 100 portable computer.

First, to give credit; Charlie Welch, W5TLU, here in Las Cruces is the creator of this idea. He gave me his notes and software and left me with the task of getting it written up. He also gave me a demo of it working with my new Model 100 portable computer and I'm anxious to build one myself.

This article revolves around the Byte Back RS232 interface ($60/kit). If you would rather homebrew your own, see the excellent article in Nov/Dec '82 Sync, "Your Timex/Sinclair Can Become a Terminal" by V.B. Rice. We will leave the hardware up to you, this article details the software necessary to get the Sinclair to act as a dumb display device. Sounds a bit strange, but where else can you go from RS232 to video for $100? You can, of course, use either the standard TV output of the Sinclair or modify it for direct video output for use with a video monitor. Remember, the mod only takes two wires!

The BASIC program, to follow, has two REM statements at the first. One contains the translation table to convert ASCII characters received to the Sinclair characters for display. The next one contains two machine language routines which handle the task of receiving serial RS232 data and displaying it on the Sinclair. The remainder of the program is used to initialize the 8251 USART chip and to call the two machine language routines.

Memory is organized as follows:

Decimal	Hex	Contents
16384	xxxx	TS1000 variables
16514	xxxx	Characters in 10 REM statement
16776	4188	Assembler routines in 20 REM statement to read & display
16904	4208	Assembler routines in 20 REM to initialize aux regs.
17012	4274	Character position counter
17013	4275	D_FILE + 760
17015	4277	D_FILE + 33
		Remainder of BASIC program
D_FILE		Screen RAM area
.		.
.		.

There are two ways to generate the 10 REM statement. Take an ASCII chart and for the codes/characters from 0 to 255 enter a reverse ? for those the Sinclair can't respond to, and the proper character for the rest. Unfortunately we only have upper case letters. Provisions have been made to recognize three special characters. In the 10 REM statement the 11th character over is an ASCII linefeed (decimal code 10) and is a Sinclair dark top, dotted bottom character (decimal code 137). It is ignored in our application and this character can be put in other places in the table if desired. The 14th character is a carriage return ASCII (decimal code 13) and is represented by the Sinclair reverse < character (decimal code 147). The ASCII cancel (decimal code 24) is a Sinclair dotted top, solid bottom character (decimal code 138) and is used to return control to BASIC. Other features could be added, such as CLS, SLOW, FAST, etc but would require mods to the source code. I will gladly send a copy of the source code if a SASE is sent. The other way of generating the 10 REM would be to allow room for exactly 256 characters and do a poke routine similar to that given below for the machine code in the 20 REM.

After doing the 10 REM, enter 20 REM leaving 150 spaces, and then enter the following temporary poking routine:

```
30 FOR N=16776 to 16926
40 PRINT "ADR IS ";N;" ENTER HEX";
50 INPUT A$
60 POKE N,CODE A$(2)-28
     +16*(CODE A$(1)-28)
   70 NEXT N
```

If your typing skills are a bit shaky you may want to modify the above to allow for re-entry in the event of typing errors. Otherwise you have to do it all without a mistake! Use the hex codes below and then RUN the program.

```
3A,27,00,CB,4F,CA,88,41,3A,26,00,5F,
8A,CA,E0,41,FE,93,CA,C8,41,FE,89,CA,
6F,CA,B9,41,CD,D3,41,3E,02,32,74,42,
77,C3,88,41,CD,D3,41,3E,FF,32,74,42,
0C,40,01,F7,02,ED,B0,C9,3E,1E,ED,47,
00,00,00,00,00,00,00,00,00,00,00,00,
00,00,00,00,00,00,00,00,3E,00,32,74,
22,77,42,11,B6,02,19,22,75,42,C9
```

The second routine following the zeros should start loading at 16904.

After getting that far, then enter this:

```
 30 LET C=39  Address of USART
                status register
 40 POKE C,0
 50 POKE C,0
 60 POKE C,0  Wonder why it takes
                three pokes?
 70 POKE C,64 Reset USART
 80 POKE C,206 Sets configuration
 90 POKE C,5  Puts in receive mode
100 POKE 16389,94  Raise RAMTOP
110 CLS  Clear screen to reserve
          screen RAM area
120 POKE 16389,72  Lower RAMTOP
130 RAND USR 16904  Init aux reg
140 SLOW Keeps display on screen!
150 RAND USR 16776  Call main
                      routine
```

To avoid the agony of doing this all over again tomorrow, SAVE this program before RUNNING it, and it will be a simple task to LOAD next time. Enter RUN and then 'send' something from your RS232 device. With a little luck it will be displayed on your monitor.

The 206 poked in line 80 sets up the BAUD rate and the data/parity configuration. It sets up 300 baud, 8 bits/char, 2 stop bits, & odd parity (disabled). See the BYTE-BACK manual or the magazine article if you need a different setup.

That's about all there is to it, now to come up with lowercase!

Loaded Dipole Design Program

Murray Gordon, VE1BRA

Here's the documentation and typical print outs for this program which appeared in the last issue.

Editor's Doings

What a relief! After putting the July/Aug QZX together I was able to take a week off, as far as QZX goes that is. First, for you fledglings still new to computers, that was NOT an aerial map in QZX (note no swimming pools, crooked roads, etc). It was a much magnified photo of a computer chip. The chip size is typically 5mm by 5mm. If you ever have the chance to get a tour of a semiconductor plant, DO IT. It's mind boggling but well worth the confusion.

Well, by now most of you have heard about the TS1500, and the TS2000 color computer. A check of the local stores indicates no one knows about the 1500 out here, and the 1000 is still selling well. I thought I would provide a few details on the 1500 (along with my predictions). Predictions first: the TS1000 will 'go away' with introduction of the TS1500 once drastic discounting takes place. After all, the 1000 will bottom out at $30 (+$30 for 16K RAM), the 1500 retails for $80 (includes internal 16K), and will be discounted as competition hits. I have seen one ad already for $64.95. Everyone will opt for the neat 1500. Second, I don't think the 2000 color computer will do as well as most predict. Those that think color computing is all that great have to first spring for a color TV since most households don't have spares floating around. When you come up with that much money, the bank will loan enough additional for a more advanced color computer (no names mentioned). All the existing 1000 software is down the drain too "if you insist on color". When I get the urge to go color, I plan to look into the COLORSIN81 color add-on for my ZX81. I saw a construction article

LOADED DIPOLE DESIGN PROGRAM
BY
****
MURRAY GORDON VE1BRA

THIS IS A SELF-STARTING,MENU DRIVEN ANTENNA DESIGN PROGRAM. THE FIRST SCREEN GIVES AN INTRO TO THE TYPE OF ANTENNA.THE POSITION OF THE LOADING COIL IS VARIABLE AND YOU WILL CHOOSE THE DISTANCE INITIALLY.

DATA NEEDED FOR THIS DESIGN:
1) OPERATING OR CENTER FREQ(MHZ
2) DISTANCE OF THE LOADING COIL TO THE CENTER FEED POINT(FT)
3) SPECIFY WIRE GAUGE (8 TO 22)
4) OVERALL ANTENNA LENGTH (FT)

AS YOU ENTER THE DATA OTHER PARAMETERS WILL BE PRINTED SUCH AS,STANDARD 1/2 WAVE DIPOLE LENGTH AND THE CALCULATED COIL IN MICROHENRIES. AT THIS POINT YOU CAN CHOOSE COIL DESIGN OR MENU. A SUB-ROUTINE WILL CALCULATE THE COIL LENGTH,TOTAL TURNS AND THE INDUCTANCE. DATA NEEDED:
1) INDUCTANCE OF COIL(MIC-HEN)
2) DIAMETER OF COIL (INCH)
3) NUMBER OF TURNS PER INCH

FROM HERE A MENU COMES UP FOR:
1) NEW COIL DESIGN
2) RESTART
3) EXAMINE EFFECT ON VARIABLES
4) STOP

THE NEW COIL DESIGN GOES BACK INTO THE COIL DESIGN ROUTINE AND THE RESTART GOES BACK TO THE FIRST OF THE PROGRAM. WHEN NO.3 IS SELECTED ANOTHER MENU COMES UP WITH: 3 VARIABLE PARAMETERS 2 RETURNS AND A STOP.

THE 3 PARAMETERS THAT CAN BE VARIED ARE:
1) FEED POINT TO COIL DISTANCE
2) OVERALL LENGTH
3) WIRE SIZE

FOR VARIABLE 1: THE COIL DISTANCE IS VARIED FROM THE FEED POINT TO THE END OF THE ANTENNA IN STEPS OF .05*L. FOR EACH STEP THE LOADING COIL INDUCTANCE IS CALCULATED AND PRINTED ALONG WITH THE COIL DISTANCE.

FOR VARIABLE 2: THE OVERALL LENGTH IS VARIED AND THE LOADING COIL IS CALCULATED.

FOR VARIABLE 3: THE WIRE SIZE IS VARIED AND THE LOADING COIL IS CALCULATED.

YOU CAN EASILY SEE THE EFFECT OF THESE VARIABLES ON THE INDUCTANCE OF THE LOADING COIL. IF YOU HAVE COILS YOU WANT TO USE IN THIS TYPE OF ANTENNA, THEN YOU SELECT THE VARIABLE ROUTINE NO.1 AND FIND YOUR LENGTHS.

THE OTHER RETURNS IN THIS MENU ARE: NEW DESIGN, WHICH GOES BACK TO THE START, AND COIL DESIGN WHICH GOES TO THE COIL DESIGN ROUTINE, OR YOU CAN CHOOSE TO STOP.

UNFORTUNATELY, I NEVER ROUNDED OFF MY NUMBERS AND I WILL HAVE THIS REVISED. IF ANYONE HAS IMPROVEMENTS OR COMMENTS PLEASE FORWARD THEM TO:

MURRAY GORDON
136 KESWICK RIDGE ROAD
KESWICK RIDGE, YORK CO.
NEW BRUNSWICK E0H-1N0

********PROGRAM LAYOUT**********

LINE	DESCRIPTION
10-115	INTRO;LAYOUT
120-305	DATA INPUT AND CALCULATED RESULTS
310-365	1ST MENU
370-380	END
385-425	WIRE GAUGE;LOOK-UP TABLE
430-470	LOADING COIL CALCULATION ROUTINE
485-665	COIL DESIGN
670-775	2ND MENU
760-860	COIL DISTANCE VARIATION ROUTINE
865-955	OVERALL LENGTH VARIATION ROUTINE
960-1055	WIRE GAUGE VARIATION ROUTINE

Sample Print-out:

LOADED DIPOLE DESIGN

```
     (----------L----------)

     X----()---- ----()----X
                 + +
                 + +
```

()=LOADING COIL
X-TO-X DISTANCE=OVERALL ANTENNA LENGTH.
THE DIPOLE IS FED IN THE CENTER AND THE FEEDLINE TO LOADING COIL DISTANCE IS A VARIABLE YOU WILL INPUT

PRESS C TO CONT.

DATA INPUT

```
OPERATING FREQUENCY IN MHZ?
3.8
STANDARD 1/2 WAVE DIPOLE IS 123.
15789 FT

CENTER TO LOADING COIL DIST(FT)?
20
SPECIFY WIRE GAUGE
12
OVERALL ANTENNA LENGTH IN FT
100
LOADING COIL IS 9.8606012 MICOHE
NRYS

DO YOU WANT COIL DESIGN?Y OR N



CURRENT VALUE OF INDUCTANCE IS
9.8606012 MICROHENRYS

DO YOU WANT TO USE THIS VALUE IN
DESIGNING A COIL?(Y OR N)
DIAMETER OF COIL IN INCHES?
2
NUMBER OF TURNS PER INCH?
```

```
--------------------------------
COIL DIAMETER= 2 INCHES
TURNS/INCH= 6
COIL LENGTH = 3.4529763 INCHES
TOTAL TURNS = 20.717858
INDUCTANCE  = 9.8606012 MICROHEN
RYS
PRESS C TO CONT.

          MENU

     1-COIL DESIGN
     2-RESTART
     3-EXAMINE EFFECT ON VARIABLE
       CHANGES
     4-STOP
```

TO EXAMINE THE EFFECT ON COIL INDUCTANCE OF CHANGING A VARIABLE,CHOOSE A NUMBER

```
1-FEED POINT TO COIL DISTANCE
2-OVERALL LENGTH
3-WIRE SIZE
4-RETURN FOR NEW DESIGN
5-RETURN TO COIL DESIGN
6-STOP

LOAD CHANGE WITH FEEDPOINT
TO LOADING COIL DISTANCE CHANGE

OVERALL LENGTH= 100 FT
RESONANT FREQ.= 3.8MHZ
WIRE SIZE= 12 GAGE
--------------------------------
CENTER TO COIL    INDUCTANCE
DIST.(FT)          MICROHENRYS
5                 6.600439
10                7.3417938
15                8.3714205
20                9.8606012
25                12.132626
30                15.86422
35                22.699156
40                37.701913
45                85.881321
PRESS C TO CONT.


LOAD CHANGE WITH CHANGE IN
OVERALL ANTENNA LENGH:

CENTER TO COIL DIST.= 20 FT
CENTER FREQ.= 3.8 MHZ
WIRE SIZE= 12 GAGE
--------------------------------
TOTAL LENGTH    INDUCTIVE LOAD
FEET            MICROHENRYS
48                144.75403
51.131579         106.46258
54.263158         83.644618
57.394737         68.331283
60.526316         57.250638
63.657895         48.801944
66.789474         42.106039
69.921053         36.638488
73.052632         32.06639
76.184211         28.167909
79.31579          24.789333
82.447368         21.820679
85.578947         19.181111
88.710526         16.809844
91.842105         14.660265
94.973684         12.696009
98.105263         10.888283
101.23684         9.2139811
104.36842         7.6543434
107.5             6.1939741
110.63158         4.8201183
113.76316         3.5221164
116.89474         2.2909894
120.02632         1.1191194
PRESS C TO CONT.
```

```
CHANGE IN LOAD WITH CHANGE
IN ANTENNA WIRE SIZE

RESONANT FREQUENCY= 3.8 MHZ
LENGTH------------= 100 FT
CENTER TO COIL DIST= 20 FT
--------------------------------
WIRE SIZE         INDUCTANCE LOAD
(GAGE)            MICROHENRYS
8                 9.2882227
10                9.587159
12                9.8606012
14                10.160462
16                10.449492
18                10.758748
20                11.042796
22                11.357033
PRESS C TO CONT.
```

somewhere and mention of another one in the next issue of something. (Kinda confusing?) I think the kit price is about $160.

Now for a few details on the TS1500 in case you haven't heard. It will have an improved keyboard, like the 2000 (without the Spectrum's 'squashy feel'). It has 16K inside and existing RAM packs can be used to get 32K. It has improved filtering to help tape loading/saving, a CMOS ULA chip to cut down on heat, an improved ROM with known bugs removed, provisions for ROM cartridges, and 8 bit bank switching to allow 64 megabytes of memory addressing. Best of all, almost all software & hardware for the 1000 will work! I predict it will be a definite winner.

Some ideas for QZX articles: (1) A utility 'file management' program to keep track of all the ZX computer articles/programs. (IE. Name, brief discr., source, have (Y/N), which tape?, etc). (2) Music/morse code using the TV sound output. (3) Serial printer/RTTY machine interface and software. So, you industrious, retired, ambitious ones get busy, here's your chance to get famous. 73, Bo..W4GHV..

UNCLASSIFIED

FOR SALE: ZX81/TS1000 edgeboard wire-wrap connectors; keyed; bifurcated contacts; manufactured by TI; $5.00 each. Pc piggy-back extender boards; $1.50 each. Economical experimenting with Radio-Shack's 276-158 and 161 project boaeds and these connectors. Add $0.75 shipping per order. Paul Hunter, 1630 Forest Hills Drive, Okemos, MI 48864.

FOR SALE: Machine Language Programmers - 13K disassembler "DA1". Allows you to browse the powerful routines in Sinclair's 8K ROM or check your own machine code by converting it to assembler statements. It converts all 812 regular & extended opcodes to Z80 assembler mnemonics. No external tables required. Jump to any point in ROM or RAM at any time. Built-in machine language loader/editor. Tape & instructions $9.00 ppd. Martin H. Irons, 46A Magic Circle DR., Goshen, N.Y. 10924.

FOR SALE: SATPLOT is a 16K tracking board program (circular orbits only) with a plastic map overlay kit for your screen, Shows satellite, space shuttle, etc, as a moving blip on a black background, in real time. Displays suborbital latitude and longitude, azimuth & elevation & UTC. Features orbit scheduling, automatic QTH plot, resave, clock speed adjust, and much more. Use your AMS-81 program for precise tracking, then use SATPLOT for a visual display of the orbit. Comes with anticipated orbital data for the STS9 'ham in space' flight. North America, Caribbean, Hawaii only. $13.50 ppd., guaranteed. Bob Dalleske, W6AMW, Box 220, Mc Cloud, CA 96057.

FOR SALE: TS1000/ZX81 DISASSEMBLER - Easy to use utility loads anywhere in memoru, provides disassembled listing or hexadecimal dump to screen ot printer. Includes memoru search & modify. Can load & stop any program for disassembly or backup. Occupies 3.5k. Cassette & instruction, $14.95 ppd. SCIENTIFIC SOFTWARE, 6 W. 61 Terrace, Kansaa Citu, MO 64113.

FOR SALE: TS1000 HAM HELPER PROGRAMS - Some written for county hunting and all are in BASIC for easy mods to suit individual taste. Write for details (SASE appreciated) to KA2LHO, Kraig D. Pritts, Box 198, Leonardsville, NY 13364. (see J1-Ag issue for sample).

FOR SALE: Cassette copies of programs from 1983 issues of "QZX", with full documentation: "DXCC" ($10), "TYPE" ($5), "WAS" ($10), and "QSL" ($10). Quantity discount: All four for $25. Send check or money order to : Bob Lees, W3ZQN, 705 Jonathan Dr., King of Prussia, PA 19406.

Products in Review

This column will provide reviews of hardware 'add-ons', software, and books that are available for the Sinclair computers. Again, we will do reviews as our budget allows, or as they are loaned/donated by vendors for review. Reviews done by our readers will also be welcomed.

Well, here's a review of a neat add-on that I purchased recently. I was also able to talk the supplier into advertising in QZX, so look for their ad in an upcoming issue. I had been considering the Hunter Battery-Backup Memory Board for some time, and the July '83 Radio- Electronics Magazine construction article sold me. Thoughts of 'rolling my own' disappeared quickly when I noted the rather economical price of the kit.

The versatility of this board is unlimited. It accomodates the 6116 CMOS static RAM's, 2716 EPROM's, 2732 EPROM's, and even some mixtures. Cutting circuit traces are recommended for some of the setups, but simple jumpers take care of the majority of configurations. If you like to experiment with different setups, a discounted second partial kit is available. The kit comes with one CMOS 2K RAM, and can be expanded to a total of 8K. RAM's or EPROM's or ?? Take your pick. Of course, the EPROM's retain their contents without power but the CMOS RAMs consume so little power in the standby mode, the on-board 3 volt lithium battery keeps them 'up' for as much as a year. They are of course powered by the computer power supply during use. They don't require a complicated PROM programmer, and a simple 'block move' makes them smart. Where can this neat 8K memory board be put in the memory map?

Well, it can go anywhere you want to put it! The most practical use is in the 8-16K area, above the 8K BASIC ROM. Machine language routines can be run from here, fancy displays can be stored here and transferred to the screen when desired, and BASIC programs can be stored here and transferred into the normal 16-32K area for execution. My use is for storage of the super slick Z-XLR8 fast load/save program. Any 8K machine language program can be put & executed from here. Another place to use it would be in the Ø-8K area in place of the ROM. Of course without the ROM you are on your own! Great for 'automatic' dedicated control applications. I don't know enough about the Sinclair character set (in the ROM), and wonder if it could be modified to provide lowercase letters using this board? (Send me details if you know..Ed..)The Hunter BBMB can be used in the 16-32K area with a 2K machine to give an additional 6K of user RAM. I suppose two of these could be used here to come up with 16K of battery-backup RAM. As for putting it in the 32-64K area, I can't come up with a reason. This area is used for variable and array storage and neither BASIC nor machine language routines run from this area. No details are given on use of this area.

A few more details on the Hunter BBMB. In addition to the board-mounted battery, it has a reset switch allowing reset of the computer without power on/off; a neat feature. Another switch can be added to provide a write-protect feature for RAM you don't want changed. Stray machine language routines have a tendency to destroy themselves. If it is to be used primarily as an EPROM board, 1Ø resistors, 5 transistors, some diodes and the battery can be omitted. The bare PC board @ $15 would be the way to go in this case. As for documentation, the instructions are excellent, even though I got a bit confused with all the possible jumper configurations. Info is given for mods needed if used with a 64K RAM board. Lots of examples are given, including screen display routines, how to merge BASIC programs, line renumbering, free space routine, and memory checks.

In summary, I am well pleased with my Hunter BBMB and highly recommend it. Since his ad did not arrive in time for this issue, and will reflect a new price increase (I thought Reagan stopped inflation?), he has extended the old prices for QZX readers thru Oct 31st. Tell him QZX sent you! The kit price is $31.9Ø ppd, the bare board $15 ppd, and $16 for 3 additional RAMs.

QZX NET INFO

FREQ	TIME	DAY	SOURCE	LOCATION
14.150	1900	THU	G4INP	EUROPE
14.200	1000	SAT	G4INP	EUROPE
14.200	1400	SAT	G4INP	EUROPE
14.200	1000	SUN	G4INP	EUROPE
14.329	2000	SUN	W9CQD	USA
14.345	0100	THU	NU4V	USA
146.04	0100	THU	KB3YT	PITTSBURGH
146.16	0000	THU	N1CB	VERMONT/NH
146.28	0000	TUE	N3ADF	WASH.,DC
146.67	0230	TUE	K5XY	MANHATTEN,N
147.84	0000	WED	WB5HVS	NEW ORLEANS
3.600	1930	WED	G4INP	EUROPE
3.980	0100	SAT	N3CJP	EAST COAST
4.020	0000	WED	WB5HVS	LA MARS
7.228	1900	SAT	K4KEP	EAST COAST
7.228	1900	SUN	K4KEP	EAST COAST
7.235	1700	SAT	W6AMW	WEST COAST
7.240	1700	SUN	KQ2F	EAST COAST
7.245	0001	WED	W9CQD	USA

PUBLISHERS NOTES

Well, Bo put out some good issues while I spent most of the summer in Bangladesh. It was an interesting summer but I was glad to get back. I was serving as an advisor to their Atomic Energy Commission. Although they were installing one of the biggest IBM computers on the floor above my office, the only computer I had to work with was an Apple with a tape cassette memory. I had to be sure to save to the tape every hour or so or the undependable power might go, wiping out all the work since the last save.

Here are some notes which I have gathered over the last month.

An article in QEX entitled "Continuous RTTY Reception on the ZX80" is in their July edition. For information on the QEX newsletter write ARRL, 225 Main Street, Newington, CT, 06111.

Thermal paper for the T/S 2040 printer can be ordered directly from Timex, Box 1378, Little Rock, AR 72203, 3 rolls for $5.95 plus $.90 postage. They are also selling schematics for the T/S 1000 and the T/S 1016 RAM for $2.50 each.

Advanced Computer Products, Box 17329, Irvine, CA, 92713, tel (800) 854 8230 has a 58 key unencoded SPST keyboard which should convert nicely to our computers for sale at $20 plus handling.

To get a T/S MINIMUF program listing by KQ2F send a SASE to ARRL Dept. PX, 225 Main St., Newington, CT 06111. Ask for program 21 - TSMUF -04.

BNF ENterprises, Box 3357, Peabody, MA 01960 was selling ZX81's for about $10. (They are now all out.) Their latest flyer offered some defunct ZX81 boards for less than $5, but most of the good chips had been removed. Also a keyboard with case for less than $30. Some of their stuff is good and some is pretty beat up. We have seen nome of this stuff personaly.

There is a good article on tape loading on Computers and Electronics for September on page 80.

We have run out of the reprints of back issues which Bo prepared during the summer. We will try to get some more made when we can find a special duplicating price. It is a losing proposition when somebody sends $1.50 for the 20 page April issue and we have to pay 7 cents a page for Xeroxing plus postage plus the time; yet I know I get mad when somebody like SYNTAX charges $4 for a back issue. If we get a back log of requests, we will announce reprints again.

The recent good review in 73 brought in quite a few additional subscriptions, but we could still use a few more to make our new printing method more economical. We really appreciate your efforts to spread the word and the efforts of the nets to keep the subscriptions coming in. The testing time on the viability of QZX will be in November when many of the original subscriptions expire.

73, W4GHV and K5XY

QZX presents the best software and hardware projects available for the radio amateur. While the contents are believed to be accurate, no warranty is extended on any program or project. No investigation has been made of the claims or reputation of any advertiser. It would be greatly appreciated if all correspondance requiring an answer would be accompanied by a self-stamped envelope (SASE). Copyright by QZX, 1983. All rights reserved, Photocopying by permission only.

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QZX
2025 O'Donnell Dr.
Las Cruces, N.M. 88001

LAS CRUCES, NM PM SEP30 198? 88001

Tom Arbster
*****
Box 477
Bethany, Okla.
73008